STUDIES IN STREPTOCARPUS II: THE STREPTOCARPUS GRANDIS ALLIANCE

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Six, or possibly seven, species, largely confined to Natal, but having close affinity with certain Tropical African species, comprise the alliance. *S. grandis* occurs throughout the forests of Zululand and the Natal Midlands, and shows considerable variation in corolla size and colouring and, to a lesser degree, in corolla shape. Its closest ally in Southern Africa is *S. cooperi* with a limited distribution range from Qudeni across the Biggarsberg to the Drakensberg at Colling's Pass and Van Reenen. *S. wendlandii* is apparently endemic in Ngoye forest and is closely related to *S. molweniensis* which is known only from kloof forests in the environs of Durban. Anomalous populations in the forests around Eshowe have affinity with these two species. *S. saundersii* is confined to coastal forests north of Durban. It is probably allied to *S. breviflos*, based on a single specimen collected by Cooper in the Orange Free State. Although Burtt (1939) reduced *S. breviflos* to synonymy with *S. saundersii*, it is preferable to maintain it provisionally as an insufficiently known species. *S. porphyrostachys*, a very distinctive species from the Umtamvuna gorge near Port Edward, has hitherto escaped notice. Its corolla and gynoecial characters advocate its inclusion in this alliance.

The alliance is circumscribed by a number of correlated morphological characters. The corolla tube is subcylindric, cylindric or narrowly infundibuliform, generally long in relation to breadth and with a cylindric mouth. Certain gynoecial characters are associated with this corolla form. The style is terete, sometimes slightly dorso-ventrally compressed apically, and shorter than the ovary; the stigma is stomatomorphic and papillose; the capsule is long and relatively slender with an inconspicuous style base.

There are striking similarities in the patterning on the floor of the corolla tube and on the lower lip in all taxa within the alliance. Vascular strands run along the floor and walls of the tube and arc out into the lobes of the lower lip, where they anastomose, thus demarcating a number of narrowly wedge-shaped, and often slightly bullate, islands of tissue. Each vein may or may not be marked by a violet line. The two most conspicuous wedges lie along the floor of the tube and continue down the centre of the anterior lobe. Two, sometimes three or four, smaller wedges are distinguishable in each lateral lobe. In the mouth of the tube, the tissue on either side of the median wedges is deep violet. The lateral wedges are invariably white though, naturally, in pale colour forms of *S. grandis* and *S. saundersii* this is obscure. The median wedges are white in *S. cooperi*, *S. wendlandii*, *S. molweniensis*, *S. porphyrostachys* and the Eshowe taxon; white, sometimes yellow, occasionally reddish in *S. grandis*; always yellow in *S. saundersii*. Although the colour of the median wedges may vary, the overall pattern is identical. Lawrence (1957), on investigating the genetics of flower pattern in *Streptocarpus*, found that "species which have been classified into groups on gross morphological criteria are found to be characterised also by their genotypes for flower pattern". Of the species under discussion, Lawrence studied only *S. grandis* and *S. wendlandii*, which he found to possess the same supergene governing flower pattern.

It is logical to conclude that there is a genotypic basis for the similarity in corolla pattern among all members of this alliance.

These species are all forest plants. With the exception of *S. porphyrostachys*, they are solitary-leaved and therefore monocarpic. The leaf can grow very big, probably in response to low light intensities in forest. Other monocarpic species, typified by *S. cooksonii*, which favour rock outcrops generally have smaller, thicker leaves than the forest dwellers, an expected response to the drier conditions and more intense illumination of exposed habitats.

General characteristics

Stemless, generally monocarpic, but one species perennial, terrestrial or epiphytic herbs. *Leaf* 1, pilose or scabridulous (rough to the touch), base cordate or obtuse, apex usually withered, upper surface rugulose, veins impressed above, prominent below. *Inflorescences* cymose, several in acropetal succession from upper surface near base of midrib. *Calyx* 5-partite. *Corolla* bilabiate, *tube subcylindric, cylindric or narrowly infundibuliform*, deflexed about the middle or almost straight, *cylindric in throat*; limb straight or slightly oblique, upper lip 2-lobed, lower lip 3-lobed. *Stamens*: fertile 2, included, epipetalous; anthers bilobed, applanate; staminodes 3, posterior minute, laterals filiform, not exceeding 8 mm. long. *Disc* annular. *Ovary* terete; *style* terete, sometimes slightly dorsoventrally compressed, shorter than ovary; *stigma* stomatomorphic, papillose. *Capsule* relatively long and slender, *persistent style base* inconspicuous.

Key to the species and anomalous populations

1a.	Ovary indumentum patent	2.
1b.	Ovary indumentum appressed	3.
2a.	Flower up to 45 mm. long, lower lip 8—15 mm. long, throat c. 10 mm. across	1. *S. grandis*
2b.	Flower 55—70 mm. long, lower lip 18—23 mm. long, throat c. 18 mm. across	2. *S. cooperi*
3a.	Corolla tube widening gradually or abruptly upwards	4.
3b.	Corolla tube approximately the same diameter throughout its length	6.
4a.	Corolla tube subcylindric below, almost ventricose apically; base of leaf obtuse	6. *S. porphyrostachys*
4b.	Corolla tube narrowly infundibuliform; base of leaf cordate	5.
5a.	Corolla tube c. 6 mm. in diam. at base, c. 9 mm. across in throat; yellow stripe on floor of tube	3. *S. saundersii*
5b.	Corolla tube c. 3 mm. in diam. at base, c. 6 mm. across in throat; no yellow stripe on floor of tube	3. Anomalous Kingscliffe population
6a.	Corolla tube c. 18 mm. long, lower lip c. 22 mm. long; hypocotyl strongly developed, undersurface of leaf beetroot red.	5. *S. wendlandii*
6b.	Corolla tube c. 21—26 mm. long, lower lip c. 12—18 mm. long; hypocotyl not always developed, undersurface of leaf usually green, sometimes red or suffused red	7.
7a.	Corolla tube c. 21 mm. long, lower lip c. 12 mm. long; capsule 69—119 (92 ± 12) mm. long	4. *S. molweniensis*
7b.	Corolla tube c. 26 mm. long, lower lip c. 18 mm. long; capsule 48—83 (65 ± 8) mm. long	5. Anomalous Eshowe populations.

1. S. grandis N.E. Br. in Bot. Mag. t. 8042 (1905)*; Tracy Hubbard in Bailey, Std. Cyclopedia Hort. 3:3274 (1937); Burtt in Kew Bull: 71 (1939) *et* in R.H.S. Dict. Gard. ed. 2, 4:2044 (1956). (Fl. Pl. S. Afr. t. 803 is discussed under *S. wendlandii*).

Cultivated specimen Hort. Bot. Reg., K, and ex Hort. Walter Ledger, K, SYNTYPES, being designated "type" in N. E. Brown's hand and annotated "originally collected in Zululand by W. J. Haygarth."

S. tubiflos C.B. Cl. in Dyer, Fl. Cap. 4(2): 441 (1904) pp. quoad spec. Gerrardianum.

Monocarpic. *Leaf* up to 380 x 330 mm., pilose, base deeply cordate, upper surface light green, lower paler, hypocotyl occasionally well developed. *Inflorescence* many flowers expanded simultaneously. *Peduncle* up to 400 mm. long, purplish-brown, pilose with glandular and eglandular hairs. *Bracts* lanceolate to linear, up to 8 x 2·5 mm., occasionally foliose, green. *Flower* 30—45 mm. long. *Pedicel* 10—17 mm. long, elongating slightly in fruit, green, pilose with glandular and eglandular hairs. *Calyx* lobes linear, 5 x 1 mm., greenish-brown, pilose, sometimes glandular. *Corolla* tube sub-cylindric to narrowly infundibuliform, slightly deflexed about the middle, medium to pale violet, pilose with patent eglandular and sometimes glandular hairs, 15—30 mm. long, base 4·5 mm. diam., throat c. 10 mm. across; upper lobes divergent, suborbicular, c. 5—6 × 5—6 mm.; lower lip 8—15 mm. long, lobes suborbicular, 4—7 × 4—7 mm.; all lobes white to medium violet, glabrous inside, paler, pilose with glandular and eglandular hairs outside; throat and base of lower lip deeper violet marked with four white wedges, often absent in pale forms, or replaced by a yellow stripe on floor of tube. *Stamens*: filaments inserted two-thirds up corolla tube, 4 mm. long, white, curved, curve dilated, sometimes purplish; anther lobes 2 mm. long, white; *Ovary* 14—20 mm. long, pale yellow suffused purple, pilose with patent eglandular and sometimes glandular hairs; style 6—8 mm. long, white, glandular. *Capsule* 65—111 (93 ± 10) mm. long, 1·2 mm. diam.

Flowering period: October to March.

NATAL. Utrecht dist., Tweekloof, *Thode* A 383, PRE, Ngotshe dist., Ngome forest, *Codd* 9594, PRE, do., c. 1060 m., *Hilliard* 864, E, K, NU; do., *Hilliard* 932 NU; SE Ngome, *Codd* 9599, PRE; near Ngome police station, *Acocks* 13947, PRE; Ingome (Ngome) *Gerrard and M'Ken* 191, K, TCD (cited by Clarke (1883) as *S. cooperi* and (1904) as *S. tubiflos*). Nongoma dist., near the windmill of the R.C. Mission, *Gerstner* 4691, PRE. Nkandla dist., Sebundini (Isibundini), *Haygarth* s.n. in herb. *Wood* 7465, NH (non K); Nkandla forest, 1220 m., *Hilliard* 821, E, K, NBG, NH, NU, do., *Lawn* 494, NH, do., *Codd* 6965, NH, PRE, do., *Codd* 9690, PRE, do., *Gerstner* 3218, PRE; 16 mls. S. Nkandla, *Reynolds*, 3226, 3228, PRE. Umvoti dist., near Ahrens, farm "Mowbray", 1050 m., *Hilliard* 1149, NU; Eshowe dist. near Eshowe, farm "Croisdale", c. 600 m., *Hilliard* 1175, NU; near Eshowe, Matchstick Hill, margin Ngotshe forest, c. 600 m., *Hilliard* 873, NU. Mtunzini dist., Ngoye forest, c. 275 m., *Hilliard* 2708, NU. Lions River dist., Karkloof, Blinkwater Bush, *Hilliard* 825, NU; Karkloof, farm "The Start", 1067 m., *Hilliard* 1210, NU. Pietermaritzburg dist., Chase Valley, 975 m., *Hilliard* 1151, NU; Swartkop, c. 1060 m., *Hilliard* 826, NU; Town Bush Valley, 975 m., *Hilliard* 856, E, NBG, NU; Table Mt., *Killick* 370, NU; Chase Valley, *v/d Merwe* 2628, PRE; Allterton *Mogg* 6573, PRE; Winterskloof, *F.G.C.* 491, J. Richmond dist., farm "Osgodsby", 1140 m., *Hilliard* 855, E, K, NU. Ixopo dist., Qunu Falls, 1036—1128 m., *Hilliard* 1150, NU.

Brown (1905) described *S. grandis* from cultivated specimens but his statement that "the species was discovered in Zululand together with *S. haygarthii*" pinpoints the type locality as Nkandla forest, because that is the type locality of *S. haygarthii*. That the plants were growing actually together is substantiated by the fact that the gatherings were mixed and Clarke (1904) mistakenly described the leaf of *S. grandis* as that of *S. haygarthii*, to which error Brown drew attention.

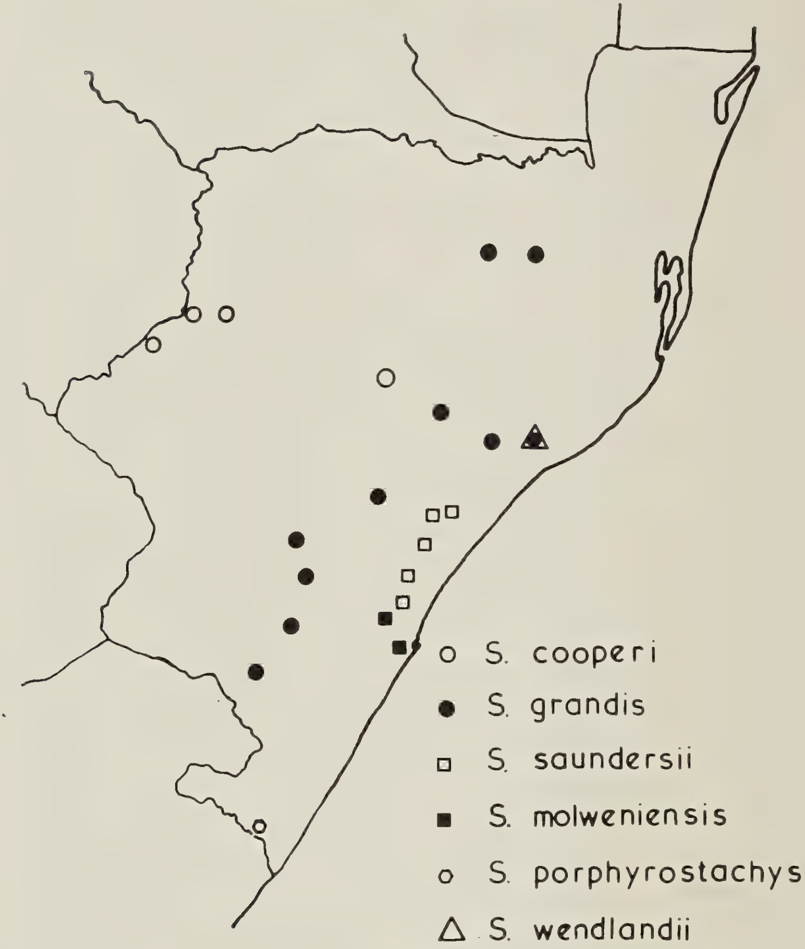
The type sheet of *S. reynoldsii*, a synonym of *S. haygarthii*, and a sheet of of *S. grandis* bear consecutive collector's numbers, indicating that Reynolds, like Haygarth forty years before him, found both species growing together, and indeed, to this day, there are sympatric populations in Nkandla forest.

S. grandis is common in Zululand forests and extends southwards through the Natal Midlands forests at altitudes of between 600 and 1200 m. (Fig. 1). It has not been recorded from the Transvaal nor from Swaziland, but it is allied to *S. solenanthus* from Tropical Africa. Like *S. solenanthus*, *S. grandis* is extremely variable in corolla colour and markings and, to a lesser degree, in corolla shape and size.

Every population of *S. grandis* is slightly different from every other population. Nkandla specimens have a narrowly infundibuliform corolla tube, which elsewhere tends towards subcylindric. (Fig. 2). Colour varies from pure white to violet, or pink, sometimes with stripes or suffusions of deeper colour on a light or white ground. A yellow streak on the floor of the tube may or may not be present.

In Nkandla forest, the shape of the corolla is constant, but the colour varies from pale to deep violet, very occasionally pink, and there is slight variation in corolla size. In the bush patches en route to Lilani, near Greytown, the corolla is often pink, or striped violet on a paler ground. Populations in Ngome forest have the largest flowers so far seen, with corolla colour varying from pale to deep violet. The floor of the corolla tube is usually deep violet longitudinally divided by a white streak, sometimes replaced by a yellow or reddish-purple one. This variation is seen in plants growing side by side. A pale yellow streak on the floor of the tube is sometimes seen in specimens from Town Bush Valley and Swartkop, Pietermaritzburg. The presence or absence of a yellow streak is interesting in view of the opinion of W. J. C. Lawrence, an authority on the genetics of the genus, quoted by Burtt and Sealy (1946) as saying that "in his experience the yellow streak is of definite diagnostic value, and that it is either present . . . or entirely absent—the distinction is absolute."

Despite its variability, *S. grandis* is not easily confused with other species. Affinity is with *S. cooperi*, the floral resemblance between *S. cooperi* and the Nkandla form of *S. grandis* being so strong that virtually corolla size alone serves to distinguish the two species. The corolla of *S. grandis* is less than 45 mm. long, that of *S. cooperi* is about 70 mm. long. Furthermore, *S. grandis* flowers in late spring, *S. cooperi* in late summer. Although Qudeni and Nkandla forests are only about ten miles apart, separated by the valley of the Nsuze



Studies in Streptocarpus
II. The S. grandis Alliance

FIG. 1.
Map of Natal showing distribution of *S. grandis* and its allies.

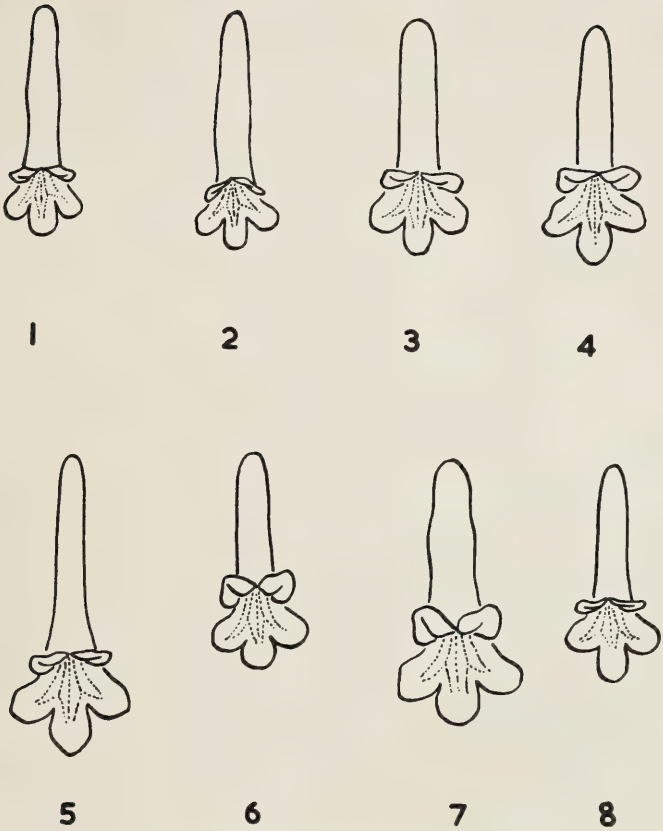


Fig. 2.
Corolla variation in *S. grandis*.
1. Town Bush Valley, Pietermaritzburg.
2. Swartkop, Pietermaritzburg.
3. Mapumulo.
4. Lilani.
5. Nkandla Forest.
6. "Croisdale" near Eshowe.
7. Ngome Forest.
8. "Osgodsby" near Richmond.

(diagrams about natural size)

river, *S. grandis*, common in Nkandla forest, is not found at Qudeni, and *S. cooperi*, common in Qudeni forest, is not found at Nkandla.

Both species have very long capsules (generally 100 mm. or more) and a patent indumentum on the ovary. These two characters readily distinguish them from *S. saundersii*, *S. wendlandii*, *S. molweniensis* and *S. porphyrostachys*, all of which have appressed pubescent ovaries, and, except *S. molweniensis*, appreciably shorter capsules.

Occasional interspecific hybrids occur in sympatric species populations. At World's View (Pietermaritzburg), *S. gardenii* is common on a tumble of mossy rocks in forest; *S. grandis* is found on steep earth banks above the rocks. One obvious intermediate between the two species was seen on a tree trunk (legit E. Moll, *Hilliard* 2125, NU). Hybrids between *S. grandis* and *S. haygarthii* are occasional in Nkandla forest (*Hilliard* 2667, NU) and between *S. grandis* and *S. confusus* in outliers of Ngome forest (*Hilliard* 931, NU).

2. S. cooperi C.B.Cl. in DC. Monog. Phan. 5:150 (1883) and in Dyer, Fl. Cap. 4(2):442 (1904).

Clarke (1883) originally cited three specimens under this name: O.F.S. but without precise locality, *Cooper* 1033; Zululand, Ingoma, *Gerrard* 191; Zambezi region, *Buchanan* 99. *Buchanan* 99, K, is *S. goetzii* Engl. (Burtt, 1939); *Gerrard* 191, K, TCD, is *S. grandis* N.E. Br.; *Cooper* 1033, K, is therefore proposed LECTOTYPE of *S. cooperi*, BM, E, TCD, ISOLECTOTYPES.

Monocarpic. *Leaf* up to 700 x 700 mm., pilose, base deeply cordate, upper surface medium green, lower paler. *Inflorescence* many flowers expanded simultaneously. *Peduncle* up to 500 mm. long, green, pilose, with glandular and eglandular hairs. *Bracts* elliptic, up to 30 × 10 mm., green, pilose. *Flower* 55—70 mm. long. *Pedicel* 15—20 mm. long, elongating in fruit, green, glandular, sparsely pilose. *Calyx* lobes lanceolate, 9 × 2 mm., green, glandular, sparsely pilose. *Corolla* tube narrowly infundibuliform, slightly saccate below near apex, medium violet, glandular, sparsely pilose, up to 45 mm. long, base 5·5 mm. diam., throat c. 18 mm. across; upper lobes divergent, suborbicular, 12 × 15 mm.; lower lip 18—23 mm. long, lobes elliptic-oblong, 12 × 9 mm.; all lobes medium violet, glabrous inside, paler, glandular outside, mouth glandular, floor of tube and base of lower lip rich violet-purple marked with four white wedges. *Stamens*: filaments inserted two-thirds up corolla tube, 9 mm. long, white, curved, curve dilated; anther lobes 3 mm. long, white suffused pale violet. *Ovary* 30 mm. long, yellowish, with patent glandular and eglandular hairs; style 8 mm. long, slightly dorsoventrally compressed apically, glandular-pilose. *Capsule* up to 150 mm. long, 2 mm. diam.

Flowering period: January to April.

NATAL: Bergville dist., Van Reenen's Pass, c. 1500 m., *Thode* 3296, STE, do., *Wood* 5704, K, NH. Klip River dist., Cundy Cleugh, 1630 m., *Hilliard* 1233, NU; Colling's Pass, 1676 m., *Hilliard* 1207, NU, Nkandla dist., Qudeni, 1067 m., *Hilliard* 862, E, K, NBG, NH, NU, do., *Fisher* 869, 863, NH, NU, PRE, do., *Fisher and Schweickerdt* 101, NH, NU, PRE, do., *Codd* 9673, PRE, do., *Gerstner* 664, PRE, do., *Edwards* 1307, PRE; Madlozi Mt., *Gerstner* 4606, PRE.

Cooper's specimen is without precise locality, but it possibly came from Nelson's Kop near Van Reenen where he is known to have collected, but I could not find the species in the badly disturbed forest on this mountain, nor at Van Reenen, locality of *Wood* 5704, cited by Clarke (1904). *S. cooperi* is still growing in the neighbouring but less disturbed Colling's Pass and Cundy Cleugh areas, and therefore appears to have a limited distribution range from the Drakensberg across the Biggarsberg to Qudeni range at altitudes of between 1050 m. and 1675 m.

It is among the most handsome of the monocarpic species, with leaves attaining a metre in length, and tall peduncles bearing numbers of large, richly-coloured flowers. Its affinities lie with *S. grandis* from which it is distinguished by its much larger flowers.

3. S. saundersii Hook. in Bot. Mag. t. 5251 (1861)*; Fl. Ser. 17, t. 1802 (1867–68); Regel, Gartenfl. 24, t. 826 (1875); N.E. Br. in Gard. Chron. 3:375 (1875); Nichols. Dict. Gard. 3:516 (1887); C.B. Cl. in DC. Monog. Phan. 5(1):150 (1883) excl. **var. breviflos** C.B.Cl. et in Dyer, Fl. Cap. 4(2):443 (1904); Fritsch in Engl. and Prantl, Pflanzenfam. 4(3B):151 (1895); Tracy Hubbard in Bailey, Std. Cyclopedia Hort. 3:3274 (1937); Burtt in Kew Bull: 78 (1939) and in R.H.S. Dict. Gard. ed. 2, 4:2045 (1956); cult. spec. Herb. Hookerianum 1867, K. HOLOTYPE.

S. tubiflos C.B.Cl. in Dyer, Fl. Cap. 4(2):441 (1904) p.p. quoad spec. Woodianum; Burtt in Kew Bull: 79 (1939). Natal, Inanda, *Wood* 752, K, HOLOTYPE, NH, ISOTYPE.

Monocarpic. *Leaf* up to 370×260 mm., pilose, base deeply cordate, upper surface light green, lower sometimes deep reddish-purple, sometimes green suffused red. *Inflorescence* many flowers expanded simultaneously. *Peduncle* up to 250 mm. long, purplish-brown, pilose. *Bracts* narrowly elliptic, slightly falcate, up to 13×3 mm., green to brown, pilose with glandular and eglandular hairs. *Flower* 26—40 mm. long. *Pedicel* 10—17 mm. long, elongating slightly in fruit, green, pilose. *Calyx* lobes linear, 6×1·5 mm., green to brown, pilose. *Corolla* tube narrowly infundibuliform, slightly deflexed about the middle, whitish below and basally, medium violet or white above, scabridulous, with occasional minute glands, 13—20 mm. long, base 6 mm. diam, mouth 9 mm. diam; upper lobes divergent, ovate, 9×8·5 mm.; lower lip 11—22 mm. long, lobes suborbicular, 10×9 mm.; all lobes medium violet or white, glandular inside, paler, pubescent outside; throat, floor of tube and base of lower lip pale to medium violet longitudinally divided by a broad yellow stripe. *Stamens*: filaments inserted halfway up corolla tube, 6 mm. long, white, curved, curve dilated, yellow, sparsely glandular; anther lobes 1·5 mm. long, white, glandular;

Ovary 10 mm. long, green, appressed pubescent; style 5 mm. long, white, pubescent, minutely glandular apically. *Capsule* 44—68 (58±5) mm. long, 2·5 mm. diam.

Flowering period: December to January.

NATAL: Mapumulo dist., Jiyana river, 610 m., *Hilliard* 838, E, K, NU, PRE. Lower Tugela dist., Upper Tongaat, farm "Erradale", 430 m., *Hilliard* 839, E, NU; White Hill 700 m., *Hilliard* 837, K, E, NH, NU; Thring's Post 792 m., *Hilliard* 1007, E, NU, PRE; Ndwedwe dist., ±1 ml. E. Ndwedwe village, 530 m., *Hilliard* 854, NU. Inanda dist; Inanda, Groeneberg, in forest, *Johnson* 1312, NH; do., 428 m., *Hilliard* 831, E, K, NBG, NU, PRE; near Umhlanga, *Haygarth* s.n., K, NH.

Hooker (1861) gave no locality other than Natal for *S. saundersii*, but Clarke (1883) cited *Wood* 752 from Inanda. *S. saundersii* still grows there, and in other localities in the coastal areas north of Durban, on steep earth or rock banks in forest. There is some variation in corolla size and colour, which may vary from pure white, to white suffused palest violet, to medium violet. Only one colour form appears in any one population and the yellow streak on the floor of the tube is always distinct.

In agreement with Burtt (1939), *S. tubiflos* (type *Wood* 752, Inanda) is here reduced to synonymy. Burtt (1939) also reduced *S. breviflos* to synonmy. *S. breviflos* was founded on *Cooper* 2766, K, from the Orange Free State. Although the specimen is admittedly a poor one, the flowers are sufficiently unlike those of *S. saundersii* to arouse doubts, especially as *S. saundersii* has a limited distribution range in the Natal coastal area. *S. breviflos* should be retained as an insufficiently known species until the appropriate parts of the Orange Free State, which is very poorly explored botanically, have been searched for Cooper's plant.

S. saundersii has close affinity with *S. wendlandii* and *S. molweniensis*. All three species have scabridulous corollas and appressed pubescent ovaries, opposed to the pilose corollas and patently hairy ovaries of *S. grandis* and *S. cooperi*. The short and relatively broad corolla tube of *S. saundersii* is easily distinguished from the narrowly subcylindric corolla tubes of *S. wendlandii* and *S. molweniensis*.

The existence of anomalous populations having close affinity with one species yet displaying characteristics of another has already been discussed and attention drawn to one such population (putative *S. polyanthus* ssp. *verecundus* x *S. prolixus*) in a rock cleft at Kingscliffe in the Great Noodbserg (Hilliard, 1966). A second anomalous population (*Hilliard* 832, NU) grows in the same cleft but is confined to its mouth where environmental conditions differ from those obtaining further back in the hillside.

The plants grow on a steep earth bank sheltered by overhanging trees and do not encroach upon the sheer rock faces favoured by the other putative hybrid population. The second population is very small, probably not more than fifty plants during any one season. The road up the face of the Kingscliffe escarpment cuts across the mouth of the cleft and it is possible that the area of suitable habitat has been much reduced in size.

Second anomalous population at Kingscliffe

Monocarpic, all parts pilose, eglandular. *Leaf* c. 160 × 140 mm., green above, reddish-purple below. *Inflorescence* several flowers expanded simultaneously. *Peduncle* up to 180 mm. long. *Flower* 22—27 mm. long. *Calyx* lobes linear, c. 3 × 1 mm. *Corolla* tube narrowly infundibuliform, slightly deflexed about the middle, white, c. 18 mm. long, base 3 mm. diam., throat c. 6 mm. diam.; upper lobes divergent, elliptic, c. 4 × 3 mm.; lower lip c. 7 mm. long, lobes broadly elliptic, c. 5 × 4 mm.; all lobes white, no markings on lower lip or floor of tube. *Stamens:* filaments inserted about halfway up corolla tube. *Ovary* c. 8 mm. long, appressed pubescent; style c. 7 mm. long, appressed pubescent. *Capsule*, immature, up to 45 mm. long.

The affinities of this population obviously lie with *S. saundersii*. The plants, which are phenotypically uniform, have red leaf undersurfaces and the same type of corolla and ovary indumentum as that species, but the corolla tube is longer and narrower than in typical *saundersii*, being similar in form to that of *S. grandis*. The corolla is white, but lacks the yellow stripe on the floor of the corolla tube, always present in *saundersii*. Herbarium material of this plant is easily mistaken for *S. grandis*. The type of indumentum on the corolla tube and ovary, however, suggests *S. saundersii*.

Fig. 1 shows the known distribution range of *S. grandis* and *S. saundersii*. The Great Noodsberg lies between the areas occupied by *S. grandis* (inland towards Pietermaritzburg and Sevenoaks) and *S. saundersii* (coastwards towards Ndwedwe and Upper Tongaat). It appears that the second Kingscliffe population is of possible hybrid origin and, like the first, has become established as a homogeneous entity in an area intermediate between the distributional ranges of the putative parents.

4. S. molweniensis Hilliard sp. nov. propinquus *S. wendlandii* Sprenger sed floribus minus numerosis paucis simul expansis, corollae tubo et capsula longioribus.

Herba acaulis, monocarpica aut terrestris aut rupicola. *Folium* 1, usque 350 × 300 mm., pilosum, ima parte cordata, apice usta, margine crenata, supra rugulosa, virens, venis impressis, infra pallidior, venis prominentibus. *Inflorescentiae* cymosae, ex ordine ab superficie adaxiali prope partem imam costae

mediae orientes; flores plurimi, pauci eodem tempore expansi. *Pedunculus* ad 450 mm. longus, fusco-viridis, pilosus. *Bracteae* lanceolatae, ad 8 × 1·5 mm., virides, pilosae. *Flos* 30—40 mm. longus. *Pedicellus* 10 mm. longus, sub fructu elongatus, viridis, pilosus. *Calyx* quinque partitus; lobi lineares, 4 × 1 mm., virides, pilosi. *Corolla* bilabiata; tubus anguste subcylindricus, circa medium abrupte deflexus, albus adapicem pallide ianthino-suffusus, scabridulus, 18—24 mm. longus, in fauce 7 mm. latus; limbus obliquus; lobi superiores divergentes, suborbiculares, 5—7 × 5—6 mm.; labrum inferius 9—14 mm. longum, lobis suborbicularibus, 5—9 × 5—8 mm.; lobi omnes albidi, extra parce pilosi, mediocriter ianthini, intus dense glandulosi, fauce soloque tubae intense ianthino, linea lata alba paullum in labrum inferius extendente bisecto. *Stamina* fertilia 2; filamenta duabus partibus supra basin corollae tubae orientia, 5 mm. longa, curvata, medio paullum dilatata, alba, glabra; antherarum lobi confluentes, 1·5 mm. longi, albi, glandulosi; staminodia 3, minima. *Ovarium* 11 mm. longum, viride, pubescens; stylus 6 mm. longus; stigma stomatomorphum, papillosum. *Capsula* torta, bivalva, 69—119 (92 ± 12) mm. longa, 1·5 mm. lata.

NATAL: Pinetown dist., Everton, Eskotene, Molweni river kloof, c. 600 m., *Hilliard* 1137, NU, HOLOTYPE, E, K, NH, PRE, ISOTYPES. Camperdown dist., on road to Shongweni, McIntosh Falls on upper Unhlatuzana River, 563 m., *Hilliard* 841, E, K, NH, NU. Pinetown dist., Everton, Eskotene, spring falling into main Molweni kloof, 600 m., *Hilliard* 849, E, K, NH, NU, PRE; Kloof, small kloof off Buckingham road, c. 550 m., *Hilliard* 1164, NU. Durban dist., Coedmore, Stainbank Nature Reserve, *Campbell* 253, NU.

Monocarpic. *Leaf* 1, up to 350 × 300 mm., pilose, base cordate, upper surface medium green, lower paler. *Inflorescence* flowers numerous, few expanded simultaneously. *Peduncle* up to 450 mm. long, greenish-brown, pilose. *Bracts* lanceolate, up to 8 × 1·5 mm., green, pilose. *Flower* 30—40 mm. long. *Pedicel* 10 mm. long, elongating in fruit, green, pilose. *Calyx* lobes linear 4 × 1 mm., green, pilose. *Corolla* tube narrowly subcylindric, abruptly deflexed about the middle, white suffused palest violet apically, scabridulous, 18—24 mm. long, base 4 mm. diam., throat 7 mm. diam.; upper lobes divergent, suborbicular 5—7 × 5—6 mm.; lower lip 9—14 mm. long, lobes suborbicular, 5—9 × 5—8 mm., all lobes whitish, sparsely pilose outside, medium violet, densely glandular inside, throat and floor of tube deep violet bisected by a broad white stripe extending briefly onto lower lip, where it is flanked by white wedges at base of lateral lobes. *Stamens:* filaments inserted two-thirds up corolla tube, 5 mm. long, curved, curve slightly dilated, white, glabrous; anther lobes 1·5 mm. long, white, glandular; staminodes minute. *Ovary:* 11 mm. long, green, appressed pubescent; style 6 mm. long, white, pubescent. *Capsule* 69—119 (92 ± 12) mm.

long, 1·5 mm. in diam.

Flowering period: December to February.

S. molweniensis grows on steep earth or rock banks in stream-bank forest, and appears to be confined to wooded kloofs within twenty miles of Durban. Except for differences in colour tone and intensity, it shows no significant variation.

Its closest ally is probably *S. wendlandii* from which it is distinguished by its less robust habit, leaves green rather than red below, less floriferous inflorescence, longer corolla tube and shorter lower lip. It also has affinity with *S. saundersii*, but the short, relatively broad corolla tube of that species is distinctive. Both *S. wendlandii* and *S. saundersii* have capsules considerably shorter than those of *S. molweniensis*.

5. S. wendlandii Sprenger in Damman Cat: 80 (1890); W. Wats. in Gard Chron. 15:590 (1894); Hook. f. in Bot. Mag. t. 7447 (1895)*; Journ. Hort. ser.3, 28:223 fig. 37; C.B.Cl. in Dyer, Fl. Cap. 4(2):44 (1904); Tracy Hubbard in Bailey, Std. Cyclopedia Hort. 3:3274 (1937)*; Burtt in R.H.S. Dict. Gard. ed. 2, 4:2045 (1956).

NATAL: Zululand, *Medley Wood* 3944, K, NH, proposed NEOTYPE. Hort. Bot. Reg. Kew 1895 is the type of Bot. Mag. t. 7447 (2 sheets).

"*S. saundersii*" (illustration only) non Hook. sec. Marloth in Fl. S. Afr. 3(2):161 t. 42 (1932)*.

Monocarpic. *Leaf* up to 450×350 mm., pilose, base cordate, upper surface medium green, lower dark reddish-purple, hypocotyl conspicuous, up to 100 mm. long, 10 mm. diam. *Inflorescence* many flowers expanded simultaneously. *Peduncle* up to 550 mm. long, reddish-brown to green, pilose. *Bracts* linear, up to 15×4 mm., reddish-brown to green, pilose. *Flower* 35—50 mm. long. *Pedicel* 14 mm. long, elongating slightly in fruit, green, pilose. *Calyx* lobes linear, 6×1·5 mm., green to reddish-brown, pilose. *Corolla* tube narrowly subcylindric, deflexed about the middle, medium violet adaxially, whitish abaxially, scabridulous, c. 18 mm. long, base 4·5 mm. diam.; upper lobes divergent, suborbicular, 8—11×8—12 mm.; lower lip 15—24 mm. long, lobes broadly elliptic, 10—14×7—12 mm.; all lobes medium violet, glandular inside, whitish, pilose outside; throat deep violet, bisected by a white streak extending onto lower lip where it is flanked by white wedges. *Stamens:* filaments inserted two-thirds up corolla tube, 4 mm. long, curved, curve slightly dilated, white sometimes suffused violet, sparsely glandular; *Ovary* 10 mm. long, greenish-yellow, appressed pubescent; style 4 mm. long, white, pubescent. *Capsule* 47—87 (64 ± 8) mm. long, 2·5 mm. diam.

Flowering period: December to March.

NATAL: Mtunzini dist., Ngoye forest, *Wood* 10865, NH, do., *Wood* 5719, K, do., 275 m., *Hilliard* 834, NU, do., legit P. Ellis, *Hilliard* 2609, NU, 2707, E, NU, do., *Huntley* 288, PRE; do., *Wood* 10, 346, PRE.

This species was originally described in a seed catalogue, the seed having been sent to Messrs. Damman by Medley Wood in 1887, as a letter attached to *Wood* 3944, K, indicates. The existence of a type specimen is doubtful. *Wood* 3944, K, NH, is therefore proposed as NEOTYPE, this being Wood's first gathering of the species.

Medley Wood collected seed and seedlings of a *Streptocarpus* in Zululand in 1887. The seed was sent to Damman of Naples, resulting in the description of *S. wendlandii*. Wood grew the seedlings at the Botanical Gardens in Durban, and in 1888 selected some for herbarium sheets (*Wood* 3944). Although Wood gave no precise locality in Zululand for these gatherings, it can be deduced that they came from Ngoye, because all specimens of *S. wendlandii* from Ngoye have a very distinctive short corolla tube and the corolla tube in *Wood* 3944 is short.

S. wendlandii was subsequently poorly described (and poorly illustrated) by Hooker (1895) and by Clarke (1904). Hooker's description was of a living plant of unstated origin, and he confused the issue still further by mistakenly calling *S. wendlandii* a native of the Transvaal. Clarke (1904) based his description on cultivated specimens and *Wood* 3944, and erroneously described the inflorescence as 6—8 inches long. Clarke (1904) also commented on *Wood* 5719 from Ngoye, the small calyx and corolla of which he considered brought it close to *S. tubiflos*. *Wood* 5719 is undoubtedly *S. wendlandii*. The range of variation in corolla size within any one population of *S. wendlandii* embraces the small flower size of this specimen.

S. wendlandii is a distinctive plant. Although the red undersurface of the leaf is not always a reliable character within *Streptocarpus*, in *S. wendlandii* it is strongly marked and appears to be constant. All the early descriptions draw attention to the beautiful colour of the leaf undersurface, and every specimen so far examined was red below. Again, in many species of *Streptocarpus*, the hypocotyl may or may not be conspicuous. In *S. wendlandii* it is always well developed so that the leaf is partly raised off the ground.

The species is, apparently, endemic to Ngoye forest where it favours steep earth banks, rock faces, or even grows epiphytically, always within the forest itself. *S. polyanthus* ssp. *verecundus* grows in crevices of the huge granite domes on the outskirts of the forest, sheltered by aspect or by the marginal fringe of vegetation where bare rock gives way to forest. Plants intermediate between this species and *S. wendlandii* are occasionally found in the intermediate zone of forest margin vegetation.

S. wendlandii is a most handsome plant, with its large leaf and tall inflorescences massed with pale violet flowers. In size and floriferousness, it is reminiscent of *S. cooperi* but is distinguished from that species by its narrower and differently shaped corolla tube, scabridulous rather than pilose; the appressed pubescent ovary and shorter capsule. The leaf of *S. cooperi* is always green below and the hypocotyl seldom conspicuous. The closest allies of *S. wendlandii* are *S. molweniensis* and *S. saundersii*, with which it shares the same type of corolla and ovary indumentum. *S. wendlandii* and *S. saundersii* both have red leaf undersurfaces (which, however, are not strongly marked in the white and pale colour forms of the latter species) and relatively short capsules, but the corolla tube of *S. saundersii* is narrowly infundibuliform rather than subcylindric and proportionately broader in relation to its length. *S. molweniensis* and *S. wendlandii* have been compared and contrasted under the description of the former species.

Anomalous populations at Eshowe

Wood collected specimens (*Wood* 11101, NH) from "Eshowe Bush" which he determined as *S. wendlandii*. These plants differ from Ngoye *wendlandii* mainly in the length of the corolla tube and of the lower lip, but there are also subtle differences, difficult to express, in the shapes of both these organs. The two are undoubtedly closely related, but there is sufficient difference to arouse doubts about their conspecificity. These doubts are heightened by the very close resemblance between the flowers of the Eshowe plant and those of *S. molweniensis*. They differ mainly in size. The most striking differences between the three taxa are tabulated below.

S. wendlandii, Ngoye	Eshowe plants	*S. molweniensis*
Leaf rich beetroot red below.	Leaf, sometimes rich red below, sometimes suffused red.	Leaf usually green below, occasionally suffused red.
Hypocotyl always conspicuous.	Hypototyl usually conspicuous.	Hypocotyl only occasionally conspicuous.
Inflorescence tall, stout, many flowers open simultaneously.	Inflorescence less robust, few flowers open simultaneously.	Inflorescence still less robust, only one or two flowers open simultaneously.
Corolla tube 18 mm. long.	Corolla tube 26 mm. long.	Corolla tube 21 mm. long.
Lower lip 15—24 (22) mm. long.	Lower lip 18 mm. long.	Lower lip 9—14 (12) mm. long.
Capsule 64 ± 8 mm. long.	Capsule 65 ± 5 mm. long.	Capsule 92 ± 12 mm. long.

Fl. Pl. S. Afr. t. 803, purporting to illustrate and describe *S. grandis*, is another facet of the problem. The plate was drawn from specimens sent by Fr. Gerstner from Eshowe. His herbarium specimen (*Gerstner* 3152, PRE), which accompanied the living material, matches *Wood* 11101: they have the same indumentum, red leaf undersurface, and prominent hypocotyl. The plant illustrated, grown from a seedling, and preserved under the same collector's number, 3152, has a broader corolla tube and a shorter lower lip than the wild plant, but the same type of indumentum. Neither specimen is *S. grandis*. One is identical with, the other very close to, *Wood* 11101, and *Hilliard* 2135, NU, from the Mpusheni Falls, Eshowe. *Gerstner* 3197, PRE, from the gorge east of the Mpusheni Falls matches *Hilliard* 2135, while *Gerstner*, sn, PRE 22608 from "Eshowe Bush" has a corolla tube widening slightly upwards but is otherwise very similar to the other three specimens.

Gerstner reported, in 1939, that the plants were very plentiful around the springs in the Hlinza and Mpusheni forests at Eshowe (see Fl. Pl. S. Afr. t. 803). The town of Eshowe partly encroaches upon the two forests, which are now a nature reserve much visited by the general public. In 1963 I could find no trace of these interesting plants except for one small population below the Mpusheni Falls, and neither the Ranger nor local residents interested in wild plants had even seen them. It has therefore proved impossible to assess either the past or present extent of the populations or their degree of variation. The Eshowe plants, like those at Kingscliffe (Page 162) are anomalous, and appear to be intermediate between *S. wendlandii* and *S. molweniensis*.

Ngoye forest, the only known locality for *S. wendlandii*, lies about ten miles east of Eshowe. *S. molweniensis* is apparently confined to coast forest near Durban. Coast forest once stretched almost uninterruptedly from Zululand to the Transkei (see Fourcade, 1889) and most of the clearing has taken place within the last eighty years. Species that once grew near the coast have disappeared and are now found only further inland. For example, Wood recorded *S. gardenii* from Umhloti and Haygarth collected *S. saundersii* near Umhlanga, but they have not been found again, despite careful searching in surviving forest patches between Durban and the Umvoti river mouth.

It is feasible that *S. molweniensis* and *S. wendlandii* were once in much closer contact than they are at present and that the Eshowe plants are the result of natural interspecific hybridisation followed by isolation in relics of formerly extensive forest. The view that these anomalous populations and others already described both in this paper and elsewhere (Hilliard, 1966) are relict hybrids can be proved correct only by genetical studies and by reconstituting the hybrids experimentally.

6. S. porphyrostachys Hilliard sp. nov. nulli arcte similis, sed affinitatem *S. grandi* N.E. Br. et *S. saundersii* Hook. habens; ab eis et forma et magnitudine et colore folii corollaeque distincta.

Herba rhizomatosa, terrestris vel rupicola. *Folium* unicum ad 250×120 mm., aliis 1—2 parvis ex rhizomate minimo orientibus adjacentibus, pilosum, ima parte terete, apice usta, margine crenato, supra rugulosa, pullo-viridissima, venis impressis; infra clare purpurea, venis eminentibus. *Inflorescentiae* cymosae, 3 aut 4 exordine ab superficie abaxiali prope basin costae mediae; flores pauci (c. 24), complures simul aperti. *Pedunculus* ad 260 mm. longus, gracilis, rubro-fuscus, parce pilosus. *Bracteae* lineares, ad 5 mm. longae, parce pilosae. *Flos* 30—43 mm. longus. *Pedicellus* 12—30 mm. longus, rubro-fuscus ad viridem, paene glaber. *Calyx* quinquepartitus; lobi lineares, 3×1 mm., fusco-virides, parce pilosi. *Corolla* bilabiata; tubus 16—26 mm. longus, anguste cylindricus infra ad orem versus ventricosus, flectus praecipue circum partem mediam flexus, parce pilosus, ianthinus, infra ad orem albus; limbus obliquus; lobi superiores suborbiculares, 5—8×5—7 mm.; labrum inferius 13—17 mm. longum, lobis oblongis, 8—10×6—7 mm.; lobi omnes ianthini, extra paene glabri, intus subtiliter glandulosi, tubae solo et ima parte labri inferioris cuneis sex albis notis purpureis claris divisis notato. *Stamina* fertilia 2; filamenta c. 5 mm. longa, curvata, in media parte dilatata, pallide ianthina, glandulosa, duabus partibus corollae tubi orientia; antherarum lobi confluentes, 1·5 mm. longi, pallide ianthini; staminodia 3, posterius minimum, lateralia 2 mm. longa, pallide ianthina. *Ovarium* c. 12 mm. longum, fuscum, subtiliter pubescens; stylus 8—12 mm. longus, pallide ianthinus, parce pubescens; stigma stomatomorphum, papillosum. *Capsule* bivalva, torta, 40—66 (48± 7) mm. longa.

Natal: Port Shepstone dist., small kloof dropping into Umtamvuna river, c. 3·5 mls. Port Edward on Izingolweni road, c. 300 m., *Hilliard* 3052, NU, HOLOTYPE, E, K, NH, ISOTYPES.

Natal: Port Shepstone dist., c. 4 mls. Port Edward on Izingolweni road, *Hilliard* 3051, K, NU, PRE; c. 3 mls. Port Edward on Izingolweni road, *Hilliard* 3050, E, K, NU.

Rhizomatous, terrestrial or lithophytic, perennial herb. *Leaf* 1, with one or two smaller ones developing from the very small rhizome and lying in the same plane as the flowering leaf, up to 250 × 120 mm., pilose with glandular and eglandular hairs, base rounded to cuneate, apex withered, margin crenate, upper surface rugulose, dark green, veins impressed, lower rich purple, veins prominent. *Inflorescences* several in acropetal succession from base of midrib and apex of rhizome, flowers few (c. 24), several open simultaneously. *Peduncle* up to 260 mm. long, slender, reddish-brown, sparsely pilose. *Bracts* linear, up to 5 mm. long, sparsely pilose to almost glabrous. *Flower*

30—43 mm. long. *Pedicel* 12—30 mm. long, reddish-brown to green, almost glabrous. *Calyx* 5-partite, lobes linear, 3 × 1 mm., brownish-green, sparsely pilose. *Corolla* bilabiate, tube 16—26 mm. long, base c. 4 mm. in diam., mouth c. 8 mm., narrowly cylindric below, widening abruptly about the middle, ventricose, slightly declinate, sparsely pilose, violet, white below near mouth; limb oblique, upper lobes suborbicular, 5—8 × 5—7 mm.; lower lip 13—17 mm. long, lobes oblong-elliptic, 8—10 × 6—7 mm.; all lobes violet, almost glabrous outside, minutely glandular inside particularly on two upper lobes in mouth of tube, floor of tube and base of lower lip marked with white wedges separated by deep violet streaks. *Stamens*: filaments inserted two-thirds up corolla tube, c. 5 mm. long, curved, dilated, violet, glandular; anther lobes 1·5 mm. long, pale violet; posterior staminode minute, laterals 2 mm. long, pale violet. *Ovary* c. 12 mm. long, brown, minutely pubescent with acute antrorse hairs and short-stalked, patent glands; style 8—12 mm. long, pale violet, sparsely pubescent; stigma pale violet. *Capsule* 40—66 (48 ± 7) mm. long

Flowering period: November to January.

S. porphyrostachys is known only from the gorges of the Umtamvuna and its tributaries, but probably occurs in the botanically unexplored area lying southward in the Transkei. The rich dark colouring of flowers and foliage is most distinctive and the relatively small, very dark green leaf, with its purple-red undersurface, makes recognition of even non-flowering specimens simple. It grows on rock faces or steep earth banks, either in forest or under rock overhangs along the lips of the gorges, wherever seepage or streamlets provide suitably damp situations. The plants appear solitary-leaved, but at the base of the leaf is a very small rhizome, which produces one or two new leaves lying in the same plane as the flowering leaf. Old, dry peduncles can sometimes be seen at the base of a flowering leaf, indicating perennation.

S. porphyrostachys appears to hybridise naturally with an undescribed rosulate plant allied to *S. primulifolius* Gandoger, which is widespread in the Umtamvuna gorges but which favours a rather drier habitat than does *S. porphyrostachys*. One plant intermediate between the two taxa was seen.

In its indumentum and short capsule *S. porphyrostachys* resembles *S. saundersii* from which, however, it differs markedly in the shape and colouring of the corolla tube and limb. Its flowers resemble in colour and markings *S. cooperi* and the Nkandla form of *S. grandis*, but the sparsely pilose corolla tube, narrowly cylindric below, almost saccate above, is quite different from the narrowly infundibuliform, pilose and glandular corolla tubes of those two species.

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